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ABSTRACT

All graduates of Eastern Illinois University from 1982, 1983, 1984, 1985, and 1986 (n=9687) were compared on high school predictor scores (American College Testing--ACTs--and class ranks) and university grade point averages (GPA)--cumulative GPA, junior and senior GPA, and junior and senior GPA adjusted by removing professional education courses. Teacher certification graduates were found to be significantly inferior to non-certification graduates on all ACT scores, but significantly superior on all university grade point averages. These findings are supported by citations of similar research which has broader longitudinal and latitudinal dimensions. The findings of "A Nation at Risk" regarding the inferiority of beginning teachers are therefore rejected. (Author)

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# ARE BEGINNING TEACHERS "BOTTOM OF THE BARREL"? AN INSTITUTIONAL STUDY OF THE ACADEMIC QUALITY OF TEACHER CERTIFICATION GRADUATES, 1982-1986

by

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In the wake of numerous reports on the general quality of American education, there has been much discussion in particular about the quality of teacher certification graduates. The National Commission on Excellence in Education, in its report A Nation at Risk: The Imperative for Educational Reform (1983), set the tone for this discussion with its comment that "not enough of the academically able students are being attracted to teaching....Too many teachers are being drawn from the bottom quarter of graduating high school and college students" (p. 22). The National Commission on Excellence in Teacher Education, in A Call for Change in Teacher Education (1985), to some extent agreed with this assessment, although it found more mixed evidence on the subject.

The drafters of A Nation at Risk and many subsequent reports have based their judgments of teacher graduate quality largely on the American College Test (ACT) and Scholastic Aptitude Test (SAT) scores of high school students declaring an intention to be teachers. These scores do not provide an adequate basis for making such a judgment. They are simply indicators of college potential and are four or five years removed from the final academic evaluation of how that potential has been realized in a teacher certification graduate. Furthermore, the use of such scores as a basis for judgment carries with it the invalid assumption that high school students expressing such an interest in teaching are subsequently admitted to and graduated from teacher certification programs.

A more realistic measure of teacher certification graduate quality is one based on the actual academic performance of teacher certification graduates. Recent studies of graduates of large state universities have shown that teacher certification graduates have higher grade point averages (GPAs) than non-teacher certification graduates (Fisher & Feldmann, 1985, and Nelli, 1984). Cohen (1984), using a balanced analysis of variance design for 18 of the campuses of the California State University system, and Lee (1985), using data from a ten year study of both public and private college graduates, also found teacher certification graduates to be superior in GPA to non-teacher certification graduates. Only the Nelli study, with 66 teacher certification graduates, controlled for possible grade inflation resulting from professional education courses. The present study, using a much larger number of graduates, examines GPAs both with, and without, the inclusion of grades in all professional education courses.

Method

The population for this study included all Eastern Illinois University graduates who received their undergraduate degrees in 1982, 1983, 1984, 1985, and 1986. The total number of degrees awarded during these years was 10,727. Some graduates received more than one degree during this period. Therefore, all degrees beyond the first were excluded so that graduates' data would be computed only once. This decision, plus data attrition due to file purging, data entry error, and the exclusion of the graduates of

two unique degree programs, reduced the population to 9,638.

Student files on semester data tapes were searched from Fall, 1979, through Fall, 1986. An individual record for each student was constructed from these files consisting of the following variables: year of graduation (1982, 1983, 1984, 1985, or 1986); semester of graduation (Fall, Spring, or Summer); type of degree program the student was in ("certification-only" if the degree could not be earned without teacher certification being coupled with it, e.g., a B.S. in elementary education; "straight-degree" if the degree did not offer the possibility of teacher certification, e.g., B.A. in philosophy; "option" if the degree could be earned with or without teacher certification being coupled with it, e.g., B.A. in History or B.A. in History with teacher certification); certification status (whether the student himself/herself was in a teacher certification program); the student's ACT scores, if available; the student's high school class percentile rank, if available; the student's cumulative GPA for all courses taken at Eastern; the student's upper division major GPA; and the student's adjusted upper division major GPA.

The upper division major GPA was based on all junior and senior level courses taken by the student which were prescribed for the student's major, either as required or elective courses. The adjusted upper division major GPA was obtained by removing all professional education courses from the upper division major GPA calculation.

Results

A 5 x 3 x 2 x 2 unbalanced analysis of variance was computed on all students' ACT scores, high school class percentile ranks, and GPAs. The independent variables were year of graduation, semester of graduation, type of degree program, and certification status. The ACT scores analyzed were the English, Mathematics, Social Studies, Natural Science, and Composite scores. The ACT analysis was based on the 5,260 graduates for whom data was available. The year of graduation was not related to these aptitude measures.

Teacher certification graduates (hereafter known as "teacher graduates") were very significantly inferior to non-teacher certification graduates (hereafter known as "non-teacher graduates") for all ACT scores, but not for high school class percentile rank ($p = .0001$).

A very significant ($p < .0001$) interaction between the kind of program a student was in (option or straight-degree) and the student's certification status (teacher or non-teacher) was found for the Mathematics, Social Studies, Natural Science, and Composite ACT scores, and a significant ($p < .002$) interaction was found for the high school class percentile rank. The interactive pattern did not apply to the English score, but all teacher graduates were very significantly inferior to all non-teacher

graduates in the non-interactive analysis of the English score (p = .0001). (See Figure 1 for the Composite ACT score interaction: mean Composite ACT score teacher graduates in certification-only programs = 18.92, for non-teacher graduates in straight-degree programs = 21.37; mean Composite ACT score for teacher graduates in option programs = 19.42, for non-teacher graduates in option programs = 19.83, p = .0001).

Academic performance was analyzed for 9,638 graduates by using three measures based on grades: the cumulative GPA, the upper division major GPA, and the adjusted upper division major GPA. Teacher graduates were very significantly superior to non-teacher graduates on all GPAs (p = .0001). There were no significant differences among the five years studied in the cumulative GPA. There was a significant omnibus F (p = .027) for upper division GPA, but none of the four orthogonal polynomial trend tests were significant. The adjusted upper division major GPA showed a significant linear (p < .025), quadratic (p < .05), and quartic (p < .025) trend over the five years. That is, for the adjusted upper division major GPA there was a general decline over the five year period with an upswing in the fourth year and subsequent decline in the fifth year (1982: mean upper division major GPA = 3.083, mean adjusted upper division major GPA = 3.064, difference = .019; 1983: mean upper division major GPA = 3.050, mean adjusted upper division major GPA = 3.038, difference = .012; 1984: mean upper division major GPA = 3.019, mean adjusted upper division major GPA = 3.012, difference = .007; 1985: mean upper division major GPA =

3.057, mean adjusted upper division major GPA = 3.054, difference = .003); 1986: mean upper division major GPA = 3.036, mean adjusted upper division major GPA = 3.034, difference = .002).

For all three GPAs, there was a very significant interaction between the kind of program graduates were in and their certification status ($p = .0001$). This interaction showed the greatest difference in GPA when non-teacher graduates in straight-degree programs were compared with teacher graduates in certification-only programs (see Figure 1: mean adjusted upper division major GPA for teacher graduates in certification-only programs = 3.28, for non-teacher graduates in straight-degree programs = 2.87). The smallest difference was between adjusted upper division major GPA of teacher graduates and non-teacher graduates in option programs (see Figure 1: mean adjusted upper division major GPA for teacher graduates in option programs = 3.16, for non-teacher graduates in option programs = 3.12).

A highly significant correlated t-test result was found when the upper division major GPA and the adjusted upper division major GPA for teacher graduates were compared ($p = .0001$, $t = 6.82$, mean upper division major GPA = 3.26, mean adjusted upper division major GPA = 3.23).

The GPAs were correlated with the ACT scores for all graduates (see Table I). Cumulative GPA is best predicted by high school class percentile rank ($r^2 = .26$), while the best ACT predictor of

cumulative GPA is the English score ($r^2$ = .17). This relationship was reflected in the multiple regression where all of the ACT scores and the high school class percentile rank were used to predict the adjusted upper division major GPA. The ACT English score, high school class percentile rank, and ACT Social Studies score, in that order, were the best predictors in the highly significant ($p < .0001$) regression equation either when entered into the equation first or last (SAS type I SS or type III SS). The ACT Mathematics score was not a significant predictor when entered into the equation first, but was a significant predictor when entered last ($p = .0001$). Only the ACT Natural Science score failed to significantly predict upper division major GPA.

To examine the difference between teacher graduates and non-teacher graduates in option programs, a 2 x 23 analysis of variance restricted to graduates who were in departments with option programs was computed for GPAs, ACT scores, and high school class percentile rank. Teacher graduates were very significantly superior on cumulative GPA (mean cumulative GPA for 1,016 teacher graduates = 3.06, for 2,941 non-teacher graduates = 2.94, ($p = .0001$). They were also significantly superior for upper division major GPA (mean upper division major GPA for 1,012 teacher graduates = 3.24, for 2,914 non-teacher graduates = 3.12, ($p = .0001$). Finally, they were significantly superior for adjusted upper division major GPA (mean adjusted upper division major GPA for 1,006 teacher graduates = 3.16, for 2,913 non-teacher graduates = 3.12, ($p = .024$).

Teacher graduates were significantly inferior on the ACT English score (mean ACT English score for 555 teacher graduates = 18.95, for 1,598 non-teacher graduates = 19.57, ($p = .003$). They were also significantly inferior on the ACT Social Studies score (mean ACT Social Studies score for 555 teacher graduates = 18.24, for 1,597 non-teacher graduates = 18.96, ($p < .014$). Finally, they were significantly inferior on the ACT composite score (mean ACT composite score for 555 teacher graduates = 19.42, for 1,595 non-teacher graduates = 19.93, ($p < .026$). They were not significantly inferior on ACT Mathematics or ACT Natural Science scores.

There were, of course, highly significant differences among majors ($p = .0001$). There was no significant interaction between major and whether or not graduates were in teacher certification programs, except for the adjusted upper division major GPA ($p < .004$). Data analysis by major, while not reported in detail here, is available from the authors.

## Discussion

A survey of more than 1,600 institutions of higher education found that there had been an increase in undergraduate GPA between the mid-1960s and the mid-1970s, but that the increase had reversed itself in the past decade (Quann, 1985). The present study indicates that grade deflation in adjusted upper division major courses occurred at Eastern over the first three years of

this study. This trend was sharply reversed in the fourth year, but a downward turn reappeared in the fifth year. The decreasing differences between the upper division major GPA and the adjusted upper division major GPA over the five years may indicate that instructors in professional education courses are more closely approximating the grading patterns of non-education instructors.

The main purpose of this study was to compare the quality of teacher graduates with non-teacher graduates at Eastern Illinois University for the years 1982, 1983, 1984, 1985 and 1986. Across all programs in these years, teacher graduates were significantly inferior to non-teacher graduates on all ACT scores, but were significantly superior on all three GPAs. The most equitable type of comparison, however, is not across all programs. It is between teacher graduates and non-teacher graduates in option programs. When this type of comparison was done, the results were basically the same as those for all programs.

It is particularly interesting to look at the adjusted upper division major GPA for teacher graduates and non-teacher graduates in option programs. The adjusted upper division major GPA is a more equitable comparative measure than the cumulative GPA because the cumulative GPA is based only on course work taken at Eastern and therefore does not reflect the previous, mostly lower division, course work of transfer students who comprise about one third of the study's population. The adjusted upper division major GPA, on the other hand, is based only on the upper division course

work prescribed for the student's major. It is a better comparative measure than the upper division major GPA because it excludes all professional education courses and thus allows for a GPA comparison of virtually the same courses for teacher graduates and non-teacher graduates within the same program.

Since a comparison of upper division major GPAs for teacher graduates and non-teacher graduates within option programs still shows the teacher graduates to be significantly superior to the non-teacher graduates, even when judged by the most demanding of academic standards, the authors reject the conclusion of A Nation at Risk regarding the inferiority of teacher graduates.

A caution needs to be added to the above conclusion. The teacher graduates in this study comprise a selected sample. In order to be admitted to, and to graduate from, a teacher certification program at Eastern, a student must have a 2.25 cumulative GPA. Candidates for graduation in non-teacher programs need only have a 2.00 cumulative GPA in order to graduate.

Criticisms of America's teacher graduates by A Nation at Risk and other studies cite the inferior aptitude of high school students declaring an intention to enter the teaching profession. A large number of these students probably do not enter teacher certification programs. Those who do may perform better than their ACT or SAT scores predict, since this study has found that the grades of those who receive teacher certification are superior to

those of non-teacher graduates. Cohen (1984), Fisher & Feldmann (1985), Lee (1985), and Nelli (1984) also found teacher graduates to be superior in GPA, supporting the representativeness of the findings of the present study.

This research leaves unanswered the predictability of college grades for the effectiveness of teaching.

In order to investigate the question of persistence in the education field for teacher graduates in this study, a follow-up survey was done by mail on 1,452 (90%) of the 1,606 graduates who had received teacher certification in the three year period of 1982 through 1984. This survey achieved a 41% return rate. The major findings were that 73% of the graduates had taken a position in the field of education. Of this number, 44% took elementary positions, 36% took secondary positions, 11% took substitute positions, 3% took aide positions, and 6% took some other type of position in the field of education. Of those who took an education position, 87% were still in the education field at the end of the 1984-85 school year. Of the number who had taken such a position in the field but later left it, 52% were 1982 graduates, 32% were 1983 graduates, and 16% were 1984 graduates. Of those who never took a position in the field of education, reasons given were: low pay 3%, family reasons 3%, entered graduate school 18%, dissatisfaction with school 2%, no education job available 49%, took some other type of position 20%, did not want job in education 3%, other reasons or no answer 4%. Of those who took an

education position but later left it, reasons given were: low pay 5%, family reasons 13%, entered graduate school 18%, dissatisfaction with school 9%, reduction in force 32%, moved to another employment field 18%, did not want job in education 4%, other reasons or no answer 2%.

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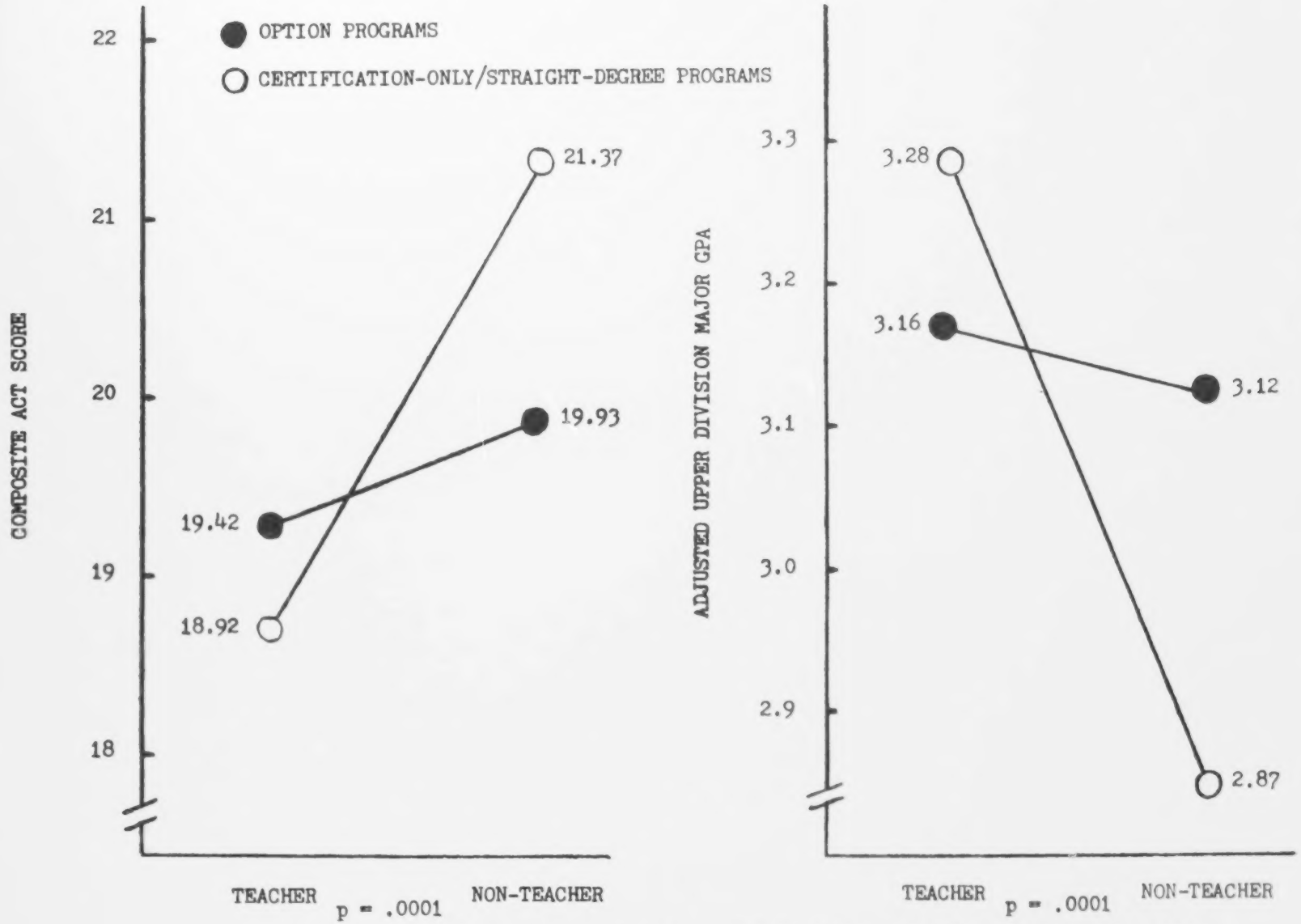


Figure 1. Interaction of Selected Teacher/Non-Teacher Variables

Table I

Correlations Between High School Predictors and College GPAs

| High School Predictor | Grade point averages | | |
|---|---|---|---|
| | Cumulative | Upper Division Major | Adjusted Upper Division Major |
| 1. High School Class percentile rank | .510 | .323 | .317 |
| 2. ACT English | .417 | .275 | .273 |
| 3. ACT Mathematics | .311 | .117 | .117 |
| 4. ACT Social Studies | .329 | .196 | .194 |
| 5. ACT Natural Science | .292 | .149 | .149 |
| 6. ACT Composite | .394 | .209 | .209 |

Note: All correlations are significant at p = .0001